

ODISHA ELECTRICITY REGULATORY COMMISSION
BIDYUT NIYAMAK BHAWAN
PLOT No.4, CHUNOKOLI, SAILASHREE VIHAR,
BHUBANESWAR – 751 021
TEL. No. 2721048, 2721049/FAX : 2721053/2721057
E-mail : orierc@gmail.com/ Website : www.orierc.org

PUBLIC NOTICE

The Commission in Case No. 35/2022 had directed to initiate Suo Motu proceeding for developing a Standard Operating Procedure for proper implementation of net-metering/bi-directional metering/gross metering /group net-metering/virtual net-metering and their connectivity order as amended upto 05.05.2022 with the consultation of the public. Accordingly, the Director (RA) of the Commission has initiated a proceeding with filing of a petition under Regulation 9(3)&(4) of the OERC (Conduct of Business) Regulations, 2004 which is available in Commission's website i.e. www.orierc.org. The interested Members of Stakeholders are requested to file their suggestions for developing Standard Operating Procedure or for further amendment to properly implement net-metering/bi-directional metering/gross metering /group net-metering/virtual net-metering and their connectivity order as amended upto 05.05.2022 with a copy to the incumbent DISCOMs of their area of residence within 29.09.2022.

By Order of the Commission

SECRETARY

ODISHA ELECTRICITY REGULATORY COMMISSION
BIDYUT NIYAMAK BHAWAN
PLOT No.4, CHUNOKOLI, SAILASHREE VIHAR,
BHUBANESWAR – 751 021

Case No. 35/2022

Director (Regulatory Affairs), OERC Designated Petitioner
Vrs.
DoE, GoO & Others Respondents

In the matter of: Pursuant to Order dated 16.08.2022 of the Commission passed in the above noted case to initiate Suo Motu proceeding under Regulation 9(3)&(4) of the OERC (Conduct of Business) Regulations, 2004

And

In the matter of: An Application seeking direction of the Commission to the Department of Energy, Govt. of Odisha, GRIDCO Ltd, DISCOMs of Odisha & OREDA for preparing a Standard Operating Procedure (SoP) as well as streamlining process and procedure for Solar Net-metering, flawless Solar billing, quick disbursal of subsidy for roof-top Solar projects to be adopted anywhere in Odisha with hassle-free procedure.

And

In the matter of: Director (Regulatory Affairs), OERC Designated Petitioner
Vrs.

1. The Principal Secretary,
Department of Energy, Government of Odisha,
Secretariat Building, Bhubaneswar-751001.
2. The Managing Director, GRIDCO Ltd.,
Janapath, Bhubaneswar-751022.
3. The Chief Executive Officer
OREDA, S-59, Mancheswar Industrial Estate,
Bhubaneswar-751010.
4. The Chief Executive Officer, TPCODL
2nd Floor, IDCO Towers, Janapath,
Bhubaneswar-751022.
5. The Chief Executive Officer, TPWODL,
At/Po : Burla, Dist : Sambalpur-768017.
6. The Chief Executive Officer, TPNODL,
At/Po : Janugang, Dist : Balasore-756019.
7. The Chief Executive Officer, TPSODL,
At/Po : Courtpetta, Dist : Berhampur-760004.

8. Shri Chandrasekhar Mishra,
Son of Shri Sankar San Mishra,
resident of 1543/2808, Khirod-Basanti Niwas,
Road No.5, Jagannath Nagar, Bhubaneswar-25.

9. Sri Prabhakar Dora, Advocate,
Vidya Nagar, 3rd Line, Co-Operative Colony,
Rayagada, Dist. Rayagada-765001.

..... Respondents

Most Respectfully sheweth:

1. That the Commission is mandated to promote Co-generation and Generation of electricity from Renewable Sources of Energy by providing suitable measures for connectivity with the Grid and sale of electricity to any person under Section 86 (1)(e) of the Electricity Act, 2003.
2. That the Commission keeping in view the above provision had issued order No.OERC-Engg.02/2010/ (Vol-III)/ 1597(A) dated 26-11-2014 relating to Net-metering/ Bi-directional metering for solar generation project including its connectivity for Government/ PSU owned and other buildings which has been amended several times the latest being on 17.01.2018.
3. That the Ministry of New and Renewable Energy, Government of India vide its letter dated 30.01.2022 has requested all State Electricity Regulatory Commissions/ Joint Electricity Regulatory Commissions to issue guidelines facilitating Group Net Metering and Virtual Net Metering for promotion of Renewable Energy.
4. That the Ministry of Power, Government of India vide its Notification dated 28.06.2021 has made amendment to the Electricity (Rights of Consumers) Rules, 2020 and has capped the maximum Net Metering capacity of a Prosumer upto five hundred kilowatt or upto the sanctioned load, whichever is lower.
5. That considering the notification of Ministry of Power and advisory of Ministry of New and Renewable Energy, Government of India, as well as suggestions from various stakeholders, the Commission had further amended the previous Order and issued an order on Net Metering/Bi-Directional Metering/Gross Metering/Group Net Metering/ Virtual Net Metering and their connectivity with respect to Solar PV Projects vide its order no.468 dt.05.05.2022.
6. That the Commission had issued the above orders anticipating that the Solar Energy Net Metering Order will create an enabling environment whereby all categories of electricity

consumers including government departments, educational institutions, hospitals, industries, commercial establishments and residential consumers will be able to make a contribution to a green and sustainable Odisha and the realization of the solar energy targets of the state.

7. That one namely Sri Chandrasekhar Mishra, Publisher of a Renewable Energy magazine has approached the Commission on various issues faced by the prosumers for installation of rooftop solar PV projects in the state of Odisha and requested for framing of an Unified Standard Operating Procedure for issuance of No Objection Certificate and smooth implementation of Net Metering by distribution licensees in Case No. 35/2022.
8. That the Commission has disposed of the case with observation that the case is not maintainable in view of restrictive scope of Section 86 of the Electricity Act, 2003. However, the Commission feels it expedient to initiate action Suo Motu on the subject matter keeping in view the power of the Commission under Regulation 9 (3)& (4) of the OERC (Conduct of Business) Regulations, 2004.
9. That the Commission has directed the Director (RA) of the Commission to change the nomenclature of that proceeding in Case No. 35/2022 by converting the same to a Suo Motu proceeding under Regulation 9(3)&(4) of the OERC (Conduct of Business) Regulations, 2004 and issue Public Notice inviting suggestions/ objections from the stakeholders/ institutions/ individuals.
10. That the Commission has directed the Director (RA) to indicate the last date of filing of suggestions/objections by the public and to put up the case thereafter for fixing the date of hearing. Registry should issue the notice to the parties those who will file their objections/suggestions with reference to the public notice along with the Petitioner and Respondents in the present case.
11. That there is no clear cut guidelines or Standard Operating Procedure for solar net metering and the issues & challenges faced by the on-grid rooftop solar Industries in the State of Odisha and such a question, comes under the jurisdiction of the Commission for issuance of appropriate direction.
12. Accordingly, the nomenclature of proceeding in case No. 35/2022 is changed to a Suo-Motu proceeding under Regulation 9(3) & (4) of the OERC (Conduct of Business) Regulations, 2004. Public Notice inviting suggestions/objections from the stakeholders / institutions/individuals on net-metering/bi-directional metering/gross metering /group

net-metering/virtual net-metering and their connectivity order of the Commission as amended upto 05.05.2022 are invited within one month from the date of issuance of Public Notice. Consequent to which the Commission may bring about standard operating procedure or any other thing required to operationalise the above order to the benefit of the public.

PRAYERS

In view of the above facts and circumstances stated above, the petitioner therefore prays to the Commission to be pleased to admit this Suo Motu application and after hearing the parties issue suitable directions/guidelines on Standard Operating Procedure for solar net metering/bi-directional metering/gross metering /group net-metering/virtual net-metering order and address the issues & challenges faced by the solar on-grid Prosumers in the State of Odisha.

By the Petitioner

Date: 29.08.2022

Place: Bhubaneswar

Director (Regulatory Affairs)

Encl: Solar net metering/bi-directional metering/gross metering /group net-metering/virtual net-metering order as amended upto 05.05.2022.

ODISHA ELECTRICITY REGULATORY COMMISSION
PLOT NO.4, CHUNOKOLI, SAILASHREE VIHAR,
BHUBANESWAR - 751021

ORDER

No. OERC-Engg. 02/2010/(Vol-IV)/1131 Dated :19.08.2016 as amended up to 17.01.2018

ON NET METERING/BI-DIRECTIONAL METERING & THEIR CONNECTIVITY
WITH RESPECT TO SOLAR PV PROJECTS

1. Preamble:

- (i) The Government of Odisha has been earnestly exploring different sources of clean energy to meet its increasing energy requirements, diversify sources of energy, and address potential climate change issues. The state of Odisha has fairly good potential for solar power generation with 280-300 days of sunshine in a year and Global Horizontal Irradiance of about 4.5-5.0 kWh/m²/day. Setting up of large solar power projects require huge land space whereas availability of land is a major constraint in major cities of Odisha. The prevailing scenario of declining trend in solar tariff and increasing retail tariff across consumer categories like residential, commercial and industrial consumers would encourage consumers to install solar systems. Therefore, generation from solar is set to witness appreciable scaling of capacities in Odisha in years to come.
- (ii) The Commission is mandated to promote Co-generation and Generation of electricity from Renewable Sources of Energy by providing suitable measures for connectivity with the Grid and sale of electricity to any person under Section 86 (e) of the Electricity Act, 2003. Keeping this in view, the Commission had issued order No. OERC-Engg.02/2010/ (Vol-III)/ dated 26-11-2014 and two amendments thereon on 18-05-2015 and 16-09-2015 relating to Net-metering/ Bi-directional metering for solar generation project including its LT connectivity for Government/ PSU owned and other buildings.
- (iii) In the meantime, the Commission has received several suggestions for effective implementation of the said Order, which is based on the Net Metering

of the “prosumers”. This needs revision of the order on several aspects. Therefore, the Commission orders as follows:

- (iv) The Commission recognises that distributed solar energy generation contributes to a significant reduction in transmission and distribution losses since the solar energy generated is consumed locally.
- (v) The Commission is committed to creating a regulatory framework that enables the realisation of the above mentioned targets with a significant contribution from the electricity consumer segment.
- (vi) This Order on Solar Energy Net Metering includes new provisions and revisions of earlier solar energy net metering provisions of which some of the highlights are described below:
 - (a) This Order applies to all solar power systems that are connected to the distribution system through an electrical service connection. The solar power system may be roof-mounted, ground-mounted, installed on an elevated structure or otherwise for captive use.
 - (b) In this Order the Commission has raised the cumulative solar energy capacity at distribution transformer level from the earlier 30% of transformer capacity to 75% of transformer capacity. The view of the Commission is that since the solar energy capacity for each consumer has been limited to the sanctioned or contracted load of the service connection, there is an adequate capacity capping mechanism which will ensure that the distribution transformer will not get overloaded even if all consumers who are connected to a distribution transformer install solar PV capacity of 100% of their sanctioned load. This view is reinforced after taking into account the experience of DISCOMs. It is also a fact that most of the solar energy generated by a consumer is self-consumed or consumed in the immediate neighborhood. The Commission may however increase/decrease the level of penetration and issue renewable energy penetration limits at overall grid level if required in the future to ensure grid stability.
 - (c) There is no cap on the capacity of solar installation at a particular consumer level as long as it is within the limit of the connected load /

75% of transformer capacity. The earlier restriction of 1 MW solar capacity at a single location is removed.

- (vii) The Commission hopes that with this Solar Energy Net Metering Order an enabling environment is created whereby all categories of electricity consumers including government departments, educational institutions, hospitals, industries, commercial establishments and residential consumers will be able to make a contribution to a green and sustainable Odisha and the realisation of the solar energy targets of the state.

2. **Definitions:**

- (a) **“Net-Meter”** means a consumer meter which is a bi-directional energy meter for measuring the quanta of electricity flowing in opposite directions and the net quantum of electricity either consumed by the consumer or injected into the distribution system of the licensee in kWh; which shall be an integral part of the net metering system.
- (b) **“Bi-directional Meter”** means a consumer meter for measuring, indicating and recording quanta of electricity flowing in opposite directions (export to the licensee’s distribution system and import by the consumer from distribution system) in Kwh including any other quantity as per the requirement. The net quantum of electricity either injected to the distribution system or imported by the consumer in Kwh is derived by arithmetical means. In case the meter is fixed with HT consumers the power factor will be based on the import of energy only.
- (c) **Eligible consumers for Net-metering/ Bi-directional Metering:** “Eligible Consumer” means a consumer of electricity in the area of supply of the distribution licensee, who uses a solar system installed in the consumer premises, to offset part or all of the consumer's own electrical energy requirements, given that such systems can be self-owned or third party owned. Both the existing and new Solar systems which comply with this order are eligible for Net-metering/ bi-directional metering.
- (d) **“Settlement period for energy accounting”** means the period ending 31st March of the relevant financial year.
- (e) **“Prosumer”** means a Consumer of electricity in the area of supply of the Distribution Licensee, who uses a self-owned or third party-owned Solar

Power System installed at the Consumer's premises, to offset part or all of the Consumer's electricity requirements.

- (f) All other words and expressions used in this Order, if not specifically defined herein above, but defined in the Act, shall have the meaning assigned to them in the Act. The other words and expressions used herein but not specifically defined in this order or in the Act but defined under any other law passed by the Parliament applicable to the electricity industry in the State shall have the meaning assigned to them in such law.

3. Net-metering/ Bi-directional Metering based Solar PV Project:

The net metering/bi-directional metering based solar projects facilitates self-consumption of electricity generated by the project and allows for feeding the surplus energy into the network of the distribution licensee. In the context of the state of Odisha the following may be the ownership arrangements for installation of such net metering based solar systems:

- Self-owned arrangement wherein owner also owns the PV system.
- Third party ownership in which a developer owns the PV system and also enters into a lease/commercial arrangement with the owner.

4. Self-owned, net metering/ bi-directional based Solar PV Project:

In a self owned, net metering/ bi-directional metering based solar PV model, the owner, who is also the electricity consumer for the utility installs the solar system at his own cost. The electricity generated by the system is first used to service consumer's captive load within the owner's premises. The solar power generated in excess of the owner's electricity consumption is fed into the grid through a net-meter/ bi-directional meter. This net-generation is then credited to the owner's account and adjusted subsequently against imports from the grid in the manner specified in this order.

5. Third party owned Solar PV net metering/ Bi-directional metering:

In the third party owned solar PV net metering/ bi-directional metering model, the developers or intermediaries lease out solar PV systems to interested owners. In this arrangement, the turnkey installers lease solar systems to individual owner. Alternatively, the installers can also offer an integrated service of leasing, commissioning and maintaining the systems to owners and guaranteeing standards of

performance. The electricity generated from such a system is used to meet the owner's internal electricity needs while the excess generation is fed into the grid on net metering/bi-directional metering basis.

6. Capacity Limits:

The capacity of an individual solar PV system would be the available capacity of the service line connection, i.e. the sanctioned load of the consumer. The installation of net metered bi-directional metered solar systems on consumer premises will utilize the same service line and installation which is currently being used by the consumer for drawal of power from utility network for injection of excess power into the Grid. If a consumer intends to install a Solar PV System of a capacity that exceeds the Contracted Load, the consumer shall submit an application for Contracted Load enhancement along with the Solar Net Metering application. The Contracted Load enhancement application will be processed by the Distribution Licensee as per standard procedure for such applications.

7. Interconnection arrangements:

Net-metering/bi-directional metering facility shall be extended to the solar power system installed in consumer premises. These consumers are the "eligible consumers" for the purpose of net-metering/ bi-directional metering. Interconnection framework for net-metering shall address parameters including connecting voltage level, minimum technical standards for interconnection as would be indicated by the Commission from time to time under relevant regulations and orders including Orissa Electricity Regulatory Commission Distribution (Conditions of Supply) Code, 2004 and amendments thereto and as per technical standards for Connectivity of Distributed Generation resources Regulations 2013 and amendments thereto notified by Central Electricity Authority. The export from and import to the system shall be at same voltage. An overview of basic grid interactive photovoltaic system is placed at Annexure-I.

8. Application:

The consumer shall make an application in the prescribed format (Annexure – II) to the distribution utility along with a fee of INR 500/- (Indian Rupees Five hundred Only). The consumer can download the solar net-metering / bi-directional metering application form from the website of the distribution utility. It can also be obtained from concerned sub-division office. Before availing the permission for solar net metering / bi-direction metering of solar PV project the consumer is to enter into an

agreement with the distribution licensee in the Standard Agreement Form. Permission will be normally issued within 15 days from the date of submission of the application to the distribution utility in their Division offices provided there is feasibility for connectivity and fulfilment of other documentary requirements as per Regulations in force.

9. Restrictions on level of overall or local grid penetration:

To address technical, safety and grid security issues arising out of possible reverse flow of electricity in the local grids, the distribution licensee shall provide net metering/ bi-directional metering arrangement to all eligible consumers as long as the cumulative capacity to be allowed for a particular distribution transformer shall not exceed 75% of the capacity of the distribution transformer.

The quantum of electricity consumed by an eligible consumer, who is not defined as an obligated entity from the solar system under net-metering / bi-directional metering arrangement shall qualify as deemed Renewable Purchase Obligation (RPO) for the distribution licensee/bulk supplier.

The Commission may however increase/decrease the level of penetration and issue renewable energy penetration limits at overall grid level, if required in the future to ensure grid stability.

10. Metering Arrangement:

Two meters would have to be installed by the solar power generator. One is for measuring solar generation and the other one is for Import/Export measurement. The first meter, the solar generation meter, has to be installed at the generator end after the inverter at the ground floor of the premises to facilitate easy access for meter reading. In case of multiple solar generations sources in a single premise, separate solar meters would have to be installed by the solar power generator/prosumer for each of the sources with facility for installation of modem alongwith all the solar meters for remote recording of monthly generation data through GSM or GPRS to the concerned distribution licensee. As an alternate, the consumer can provide the soft copy of dump data of solar generation meter in .xml/cdf/dmd/emd/mrd format through email to the concerned licensee in the first week of succeeding month. Notwithstanding the above provision of remote meter reading, manual reading can also be taken by the licensee in case of emergency or if situation so warrants arising out of technical deficiencies or force majeure situations. In that case the manual reading shall be treated as final reading for all purposes. One net meter/bi-directional meter (single phase or three phase as per requirement) capable of recording import and export of power in KWh is to be installed which shall be accepted by all for commercial settlement. These meters should be MRI and AMR complaint.

Provided that till the BIS and CEA standards are available the following standards shall be followed. Once the standards are available, all the net meter / bi-directional meter to be installed shall follow the relevant guideline. The existing net meter / bi-directional meter already installed before the publication of standards shall be allowed to continue.

Provided that for HT connections (11kV and above), the applicable meter can be a bi-directional meter (Category-B) and complying with the existing IS-14697 and IS 15959 standards.

Provided that for LT connections (below 11kV), the applicable meter shall comply with the existing meter standards IS 14697 for CT operated static watt-hour meters and IS-13779 for ac static watt-hour meters with additional requirement of two registers, as Import and Export register, to record the import and export of electricity.

Provided further that all the meters should also comply with IS-15959 (Indian Standards for Data Exchange for electricity meters). There shall be a separate Solar Generation Meter to record the total solar generation in the consumer premises after the power conditioning unit.

- (a) The meters shall adhere to the standards for consumers specified by the Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006 and Central Electricity Authority (Installation and Operation of meters) Amendment Regulations, 2010 as amended from time to time.
- (b) The Distribution Licensee shall host the list of approved manufacturers of such meters in their website.
- (c) Installation of Check meter for the solar energy system would be optional.
- (d) The cost of meters, cost of connectivity and all other related cost for setting up the meters etc. have to be borne by the eligible consumers under guidance of the concerned distribution licensee. Either consumer or distribution licensee shall procure the meter. The distribution licensee shall test and install the same.
- (e) The meters installed shall be jointly inspected and sealed by the Licensee on behalf of both the parties. It shall be tested by the licensee and installed in the presence of the representatives of the consumer or himself and the distribution licensee with due acknowledgement. In case desired by the consumer the licensee shall allow the presence of the same during testing by intimating test date and time in advance. Position & sealing of meters will be guided by the

same provisions as applicable to consumer meters in the Central electricity Authority's Metering Regulations/Supply Code.

- (f) The meter reading, both net meter and solar generation meter shall be taken by the distribution licensee and shall form the basis for commercial settlement. The copy of the meter reading statement shall be handed over to the consumer as soon as meter reading is taken.

11. Energy Accounting:

- (a) Electricity generated from a Solar PV project shall be capped cumulatively at 90% of the electricity consumption by the eligible consumer at the end of a settlement period which ends with the financial year to allow for seasonality in generation. In case of the financial year where Commercial Operation Date (COD) occurs, the 90% capping shall be on the energy consumed by the consumer from the date of COD to the end of the financial year.
- (b) The carry forward of excess energy generation will be allowed from one billing cycle to the next billing cycle till the end of the same financial year. Any excess generation (above 90 per cent) at the end of the financial year would be considered as free energy and shall not be offset against the consumer's consumption. There shall not be any carry forward of energy to the next financial year.
- (c) The imported energy shall be eligible for normal ToD benefit as per the order of the Commission prevailing at that time.

12. Billing and Payment:

- (a) The consumer shall receive a monthly net import/export bill indicating either net export to the Grid or net import from the Grid.
- (b) In case of net import bill, i.e. if any electricity is supplied by the distribution licensee to the consumer, the distribution licensee shall raise invoice for the net electricity imported after taking into account any carry forward of energy from previous billing periods in the same financial year. The net energy imported has to be billed by the Distribution Licensee as per the tariff in force applicable to that category of consumers.
- (c) In case of export of energy in excess of the consumption of the consumer in a billing cycle shall be carried forward to the next billing cycle for adjustment

against next month's import bill if any. No interest will be payable on this carry forward energy amount.

(d) In case of defective net metering/ bi-directional metering, the followings shall apply:

(i) If the solar net-metering facility has been in service for more than 12 months:

The active energy import, active energy export and active energy net import readings of the corresponding period of the previous year will be taken for billing purpose by the DISCOMs.

(ii) If the solar net-metering facility has been in service for less than 12 months:

The net active energy to be billed by DISCSOM per month = (Average energy consumption (imported active energy) during the last three billing cycles prior to the installation of the bi-directional/ net meter) - KWP of Solar PV generator x 124.

13. LT Connectivity:

(a) The Technical Standards for connectivity shall be as specified in the CEA's (Technical Standards for connectivity of the Distributed Generating Resources) Regulations, 2013 and as amended from time to time.

(b) The maximum capacity for interconnection with the distribution licensee's system at a specific voltage level shall be limited to the contract demand of the consumer as per his agreement with the distribution licensee for a single net / bi-directional metering point.

(c) The important clauses related to the technical and interconnection requirements are provided below:

Parameter	Reference	Requirement
Overall conditions of service	OERC Distribution (Conditions of Supply) Code, 2004 and amendments thereto	Reference to regulations
Overall Grid Standards	CEA (Grid Standard) Regulations, 2010	Reference to regulations
Equipment	BIS / IEC / IEEE	Reference to standards
Meters	CEA (Installation & operation of meters) Regulation 2006 and amendment thereto	Reference to regulations and additional conditions issued by OERC
Safety and supply	CEA (Measures relating to Safety	Reference to regulations

Parameter	Reference	Requirement
	and Electricity Supply) Regulations, 2010	
Harmonic Current	IEEE 519 CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations, 2013	Harmonic current injections from a generating station shall not exceed the limits specified in IEEE 519
Synchronization	IEEE 519 CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations, 2013	Photovoltaic system must be equipped with a grid frequency synchronization device. Every time the generating station is synchronized to the electricity system it shall not cause voltage fluctuation greater than +/- 5% at point of connection.
Voltage	IEEE 519 CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations, 2013	The voltage-operating window should minimize nuisance tripping and should be under operating range of 80% to 110% of the nominal connected voltage. Beyond a clearing time of 2 second, the photovoltaic system must isolate itself from the grid.
Flicker	IEEE 519 CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations, 2013	Operation of Photovoltaic system should not cause voltage flicker in excess of the limits stated in IEC 61000 standards or other equivalent Indian standards, if any.
Frequency	IEEE 519 CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations, 2013	When the Distribution system frequency deviates outside the specified conditions (50.5 Hz on upper side and 47.5 Hz on lower side), There should be over and under frequency trip functions with a clearing time of 0.2 seconds.
DC injection	IEEE 519 CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations, 2013	Photovoltaic system should not inject DC power more than 0.5% of full rated output at the interconnection point or 1% of rated inverter output current into distribution system under any operating conditions.
Power Factor	IEEE 519 CEA (Technical Standards for Connectivity of the Distributed	While the output of the inverter is greater than 50%, a lagging power factor of

Parameter	Reference	Requirement
	Generation Resources) Regulations, 2013	greater than 0.9 should operate.
Islanding and Disconnection	IEEE 519 CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations, 2013	The photovoltaic system in the event of fault, voltage or frequency variations must island/disconnect itself within IEC standard on stipulated period.
Overload and Overheat	IEEE 519 CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations, 2013	The inverter should have the facility to automatically switch off in case of overload or overheating and should restart when normal conditions are restored.
Paralleling Device	IEEE 519 CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations, 2013	Paralleling device of photovoltaic system shall be capable of withstanding 220% of the normal voltage at the interconnection point.

* The technical and interconnection requirement shall undergo change as and when the above Regulation / Standards get amended.

14. Operation and Maintenance

- (a) The solar PV projects shall comply with the relevant standards and guidelines specified by the MNRE / BIS and CEA. The responsibility of operation and maintenance of the solar PV projects including all its accessories and apparatuses lies with the consumer. The design and installation of the solar PV project should be equipped with appropriately rated protective devices to sense any abnormality in the system and carry out automatic isolation of the solar PV project from the network of the Distribution Licensee. The inverters used should meet the necessary quality requirements as specified and checked by the Supply Engineer before putting into service. The protection logics should be tested before commissioning of the plant. The installation shall meet all safety standards and safety certificates for the installations should be obtained from the appropriate authorities.
- (b) The automatic isolation or islanding protection of solar PV projects should be ensured for, no grid supply, low or over voltage conditions and within the required response time. Fuses and fast acting circuit breakers of adequate rating on input and output side of the inverters and disconnect / isolating switches to isolate DC and AC system for maintenance shall be provided. The consumer

should provide for all internal safety and protective mechanism for earthing, surge, DC ground fault, transients etc. as per the CEA regulation/standards.

- (c) To prevent back feeding and possible accidents when there is no supply from distribution licensee's side, Double pole /Triple pole isolating disconnect switches which can be locked by distribution licensee personnel should be provided by the consumer. This is in addition to automatic sensing and isolating on grid supply failure etc and also in addition to internal disconnect switches. In the event of distribution licensee's supply failure, the consumer has to ensure that there will not be any solar power being fed to the system of distribution licensee. The consumer is solely responsible for any accident to human beings /animals whatsoever (fatal /non-fatal / departmental /non-departmental) that may occur due to back feeding from the solar PV projects when there is supply failure from distribution licensee's side. Distribution licensee reserves the right to disconnect the installation at any time in the event of damage to its grid, meter, etc. or to prevent further accident or damage.
- (d) The consumer shall abide by all the codes and regulations issued by the CEA/OERC to the extent applicable and in force from time to time. The consumer shall comply with CEA/IEGC/OGC/OERC/distribution licensee's requirements with respect to safe, secure and reliable function of the Solar PV projects. The power injected into the distribution licensee's system shall be of the required quality in respect of wave shape, frequency, harmonic standard and absence of DC components etc.
- (e) The Solar PV projects shall restrict the harmonic generation within the limit specified in the agreement or specified by the Central Electricity Authority by regulation.
- (f) The Solar PV projects established under net metering/ bi-directional metering procedure may have also battery backup.

When the consumer prefers LT connectivity with battery backup (full load backup/partial load backup), the inverter shall have separate backup wiring to prevent the battery/DG power from flowing into the grid in the absence of grid supply and manual isolation switch shall also be provided. The manual isolation switch shall have locking facilities to enable distribution licensee personnel to keep it switched off and locked during maintenance works.

- (g) The inverter standard shall be such that it should not allow solar power/battery power/DG power to extend to distribution licensee's supply system on failure of distribution licensee's grid supply, irrespective of the LT connectivity options.
- (h) The inverter should be a sine wave inverter. Harmonic standards shall be as per IEEE 519. To avoid DC injection into the grid and to ensure other power quality parameters, the AC output of the inverter shall be connected through an Isolation Transformer to the distribution licensee's system.
- (i) Application for Solar PV Project connectivity shall be submitted to the concerned section officer along with application fee specified in this order.
- (j) The net-metering / bi-directional metering connection agreement is furnished in Annexure-III.

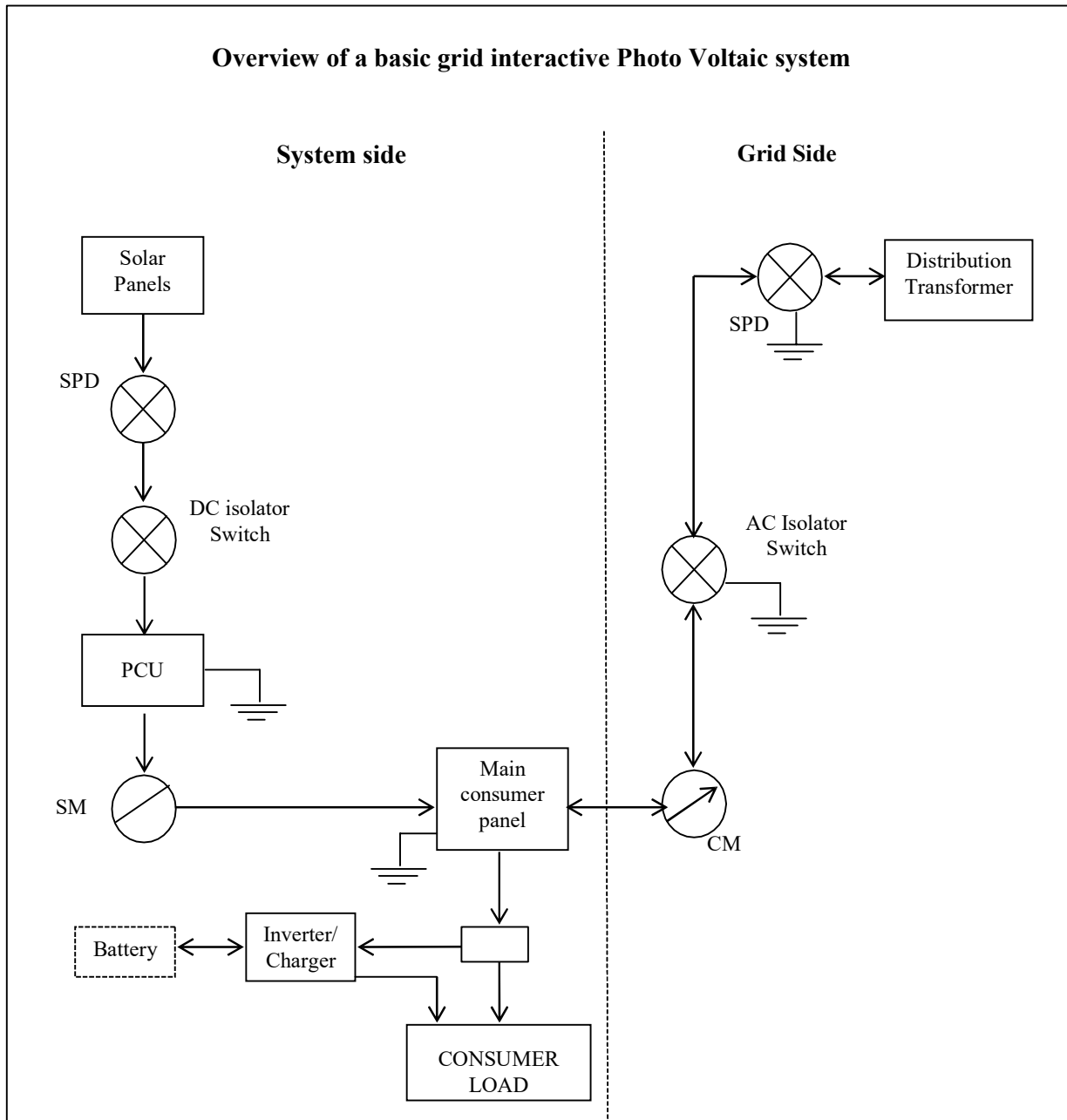
15. Applicability of Renewable Energy Certificates and RPO

Solar Energy generated by Net-metering/ bi-directional metering project is not eligible for Renewable Energy Certificate (REC). The energy generated by an eligible consumer, who is not defined as an obligated entity from the solar PV projects under net-metering arrangement shall qualify as deemed Renewable Purchase Obligation (RPO) for the distribution licensee/ bulk supply licensee. The Distribution Licensee shall furnish a copy of solar energy generated by the eligible consumer to GRIDCO every year in the month of April for the solar energy generation of the previous financial year.

16. The present order supersedes the earlier order of the Commission on Net Metering / Bi-directional Metering and their connectivity with respect to Rooftop Solar PV Projects on the rooftop of Government/ PSU owned buildings dated 26.11.2014 and its amendments dated 18.05.2015 and 16.09.2015. This order is applicable both to the prospective net metered solar consumers and to the existing similar categories of consumers.

By Order of the Commission

**Sd /-
SECRETARY I/c**



SPD- Surge Protective Device, PCU- Power Conditioning Unit, SM-Solar Generation Meter, CM- Consumer Meter (Net meter or Bi-directional meter)

- * A separate/wiring arrangement should be made from inverter/charger to the consumers critical load.
- * The actual connectivity diagram may vary depending upon site specification.

FORM-1

Net Metering/Bi-directional Metering Connection Application

To

The Section Officer/Designated Officer
Distribution Licensee
[Name of office]

Date:

I / we herewith apply for a solar energy net-metering/ bi-directional metering connection at the service connection for the Solar PV Project of which details are given below

1.	Name of applicant	
2.	Address of applicant	
3.	Service connection number	
4.	Telephone number(s)	
5.	Email ID	
6.	Solar PV Project capacity (Watts)	
7.	Solar PV Project inverter make and type	
8.	Solar PV Project inverter has automatic isolation protection (Y/N)?	
9.	Has a Solar Generation Meter been installed (Y/N)?	
10.	Expected date of commissioning of solar PV Project.	
11.	Concerned safety requirement fulfilled (Y/N)	

DECLARATION

I do hereby declare that the information furnished above is true to my knowledge and belief.

Signature with Name:
Address:

FORM - 2

Standard Agreement Form for Net-metering/ Bi-directional metering of Solar PV Project

This Agreement is made and entered into at (location) on this (date)_____day of (month) between The Eligible Consumer, residing at (address) as first party AND _____ Distribution Licensee (herein after called as Distribution Licensee) and having its registered office at (address) as second party of the agreement.

And whereas, the Distribution Licensee agrees to benefit the eligible consumer for the electricity generated from his Solar PV Project of capacity_____watts and as per conditions of this agreement and net-metering/ bi-directional metering orders issued by the Odisha Electricity Regulatory Commission.

Both the party hereby agrees to as follows:

1. Eligibility

Eligibility for net-metering/ bi-directional metering has been as specified in the relevant order of the Odisha Electricity Regulatory Commission. Eligible consumer is required to be aware and understood, in advance, of the standards and conditions of his system for being integrated into distribution system in conformity with the order of the Commission and other conditions mentioned.

2. Technical and Interconnection Requirements

The eligible consumer agrees that his solar PV Project and net' metering/ bi-directional metering system will conform to the standards and requirements specified in the following Regulations and codes as amended from time to time.

- a) CEA's (Technical Standards for connectivity of the Distributed Generating Resources) Regulations, 2013 and amendments thereto.
- b) Central Electricity Authority (Installation and Operation of Meters) Regulation 2006 and amendments thereto.
- c) OERC Distribution (Conditions of Supply) Code, 2004 and amendments thereto.

Eligible consumer agrees that he has installed / will install, prior to connection of Photovoltaic system to Distribution Licensee's distribution system, an isolation device

(both automatic and inbuilt within inverter and external manual relays) and agrees for the Distribution Licensee to have access to and operation of this, if required and for repair and maintenance of the distribution system.

Eligible consumer agrees that in case of a power outage from Distribution Licensee's system the photo voltaic plant will not inject any power into Licensee's distribution system and also ensures that automatic isolation or islanding protection of Solar PV system.

All the equipment connected to distribution system must be compliant with relevant international (IEEE/IEC) or Indian standards (BIS) and installations of electrical equipment must comply with Central Electricity Authority (Measures of Safety and Electricity Supply) Regulations, 2010 and amendments thereto.

Eligible consumer agrees that licensee will specify the interface/inter-connection point and metering point.

Eligible consumer and licensee agree to comply with the relevant CEA regulations in respect of operation and maintenance of the plant, drawing and diagrams, site responsibility schedule, harmonics, synchronization, voltage frequency, flicker etc.,

Due to Distribution Licensee's obligation to maintain a safe and reliable distribution system, eligible consumer agrees that if it is determined by the Distribution Licensee that eligible consumer's photovoltaic system either causes damage to and/or produces adverse effects on other consumers or Distribution Licensee's assets, eligible consumer will have to disconnect photovoltaic system immediately from the distribution system upon direction from the Distribution Licensee and correct the problem at his own expense prior to a reconnection.

3. Clearances and Approvals

The eligible consumer agrees to obtain all the necessary approvals and clearances (environmental and grid connected related) before connecting the photovoltaic system to the distribution system.

4. Access and Disconnection

Distribution Licensee shall have access to metering equipment and disconnecting means of photovoltaic system, both automatic and manual, at all times.

In emergency or outage situation, where there is no access to a disconnecting means, both automatic and manual, such as a switch or breaker, Distribution Licensee may disconnect service to the premise.

5. Liabilities

Eligible consumer and Distribution Licensee will indemnify each other for damages or adverse effects from either party's negligence or intentional misconduct in the connection and operation of photovoltaic system or Distribution Licensee's distribution system.

Distribution Licensee and eligible consumer will not be liable to each other for any loss of profits or revenues, business interruption losses, loss of contract or loss of goodwill or for indirect, consequential, incidental or special damages, including, but not limited to, punitive or exemplary damages, whether any of the said liability, loss or damages arise in contract, or otherwise.

Distribution Licensee shall not be liable for delivery or realization by eligible consumer for any fiscal or other incentive provided by the Central/State government beyond the scope specified by the Commission in its relevant Order.

6. Commercial Settlement

All the commercial settlement under this agreement shall follow the Net metering order issued by the OERC.

7. Connection Costs

The eligible consumer shall bear all costs related to setting up of photovoltaic system including metering and interconnection costs. The eligible consumer agrees to pay the actual cost of modifications and upgrades to the service line required to connect photovoltaic system in case it is required.

8. Termination

The eligible consumer can terminate agreement at any time by providing Distribution Licensee with 90 days prior notice.

Distribution Licensee has the right to terminate Agreement on 30 days prior written notice, if eligible consumer breaches a term of this Agreement and does not remedy the breach within 30 days of receiving written notice from Distribution Licensee of the breach.

Eligible consumer agrees that upon termination of this Agreement, he must disconnect the photovoltaic system from Distribution Licensee's distribution system in a timely manner and to Distribution Licensee's satisfaction.

In the witness, whereof of Mr. _____ for and on behalf of _____
(Eligible consumer) and Mr. _____ for and on behalf of _____
(Distribution Licensee) sign this agreement in two originals.

Eligible Consumer Name

Distribution Licensee Name

Address

Designation

Service Connection Number

Office Address

Witness to the execution
on behalf of eligible consumers

Witness to the execution
on behalf of Distribution Licensee

1. Name :
Address :

1. Name :
Address :

2. Name :
Address :

2. Name :
Address :

* The Licensee may impose any other condition(s) depending upon the requirement of connectivity of a specific project. The additional condition(s), if any, should conform OERC Distribution (Condition of Supply) Code, 2004.

**ODISHA ELECTRICITY REGULATORY COMMISSION
PLOT NO.4, CHUNOKOLI, SHAILASHREE VIHAR,
BHUBANESWAR – 751021**

ORDER

No. OERC-Engg. 02/2022/468

Dated:05.05.2022

The Commission had issued an order on 19.08.2016 on Net Metering / Bi-directional Metering and their connectivity with respect to Rooftop Solar PV Projects which was subsequently amended up to 17.01.2018. Now, several issues such as group net metering, virtual net metering etc. have been brought before the Commission by various stakeholders which necessitates for further amendment of the said Order. In the meantime, the Delhi Electricity Regulatory Commission has come up with Group Net metering and Virtual Net Metering Guidelines in 2019. Ministry of New and Renewable Energy, Government of India vide its letter dated 30.01.2022 has also requested all State Electricity Regulatory Commissions/ Joint Electricity Regulatory Commissions to consider issuing similar guidelines facilitating Group Net Metering and Virtual Net Metering for promotion of Renewable Energy. Moreover, this Commission has been receiving proposals from some consumers in Odisha for inclusion of provision of Group metering that will bring further investment in the renewable energy sector. In addition to the above, Ministry of Power, Government of India vide its Notification dated 28.06.2021 has made amendment to the Electricity (Rights of Consumers) Rules, 2020 and has capped the maximum Net Metering capacity of a Prosumer upto five hundred kilowatt or upto the sanctioned load, whichever is lower. After considering the notification of Ministry of Power and advisory of Ministry of New and Renewable Energy, Government of India, as well as suggestions from various stakeholders, the Commission hereby makes the following amendments to the previous Order which will be known as Net Metering/Bi-Directional Metering/Gross Metering/Group Net Metering/Virtual Net Metering and their connectivity with respect to Solar PV Projects 2016 (as amended upto 05.05.2022).

Amendment to the Order on Net Metering/Bi-Directional Metering & their Connectivity with respect to Solar PV Projects 2016 (as amended upto 17.01.2018)

Clause 1 (vi)(c) of the “Preamble” shall be replaced as under:

Net metering to a Prosumer shall be allowed for loads upto five hundred kilowatt (500 kW) or upto the sanctioned load, whichever is lower as long as it is within the limit of 75% of transformer capacity.

After Clause 2 (c) the following shall be inserted, namely:-

- (d) *“Net-metering” means a mechanism whereby solar energy exported to the Grid from Grid Interactive Solar Photovoltaic system of a Prosumer is deducted from energy imported from the Grid in units (kWh) to arrive at the net imported or exported*

energy and the net energy import or export is billed or credited or carried-over by the distribution licensee by using a single bidirectional energy meter for net-metering at the point of supply.

- (e) *“Gross-Metering” means a mechanism whereby the total solar energy generated from Grid Interactive Solar Photovoltaic system of a Prosumer and the total energy consumed by the Prosumer are accounted separately through appropriate metering arrangements and for the billing purpose, the total energy consumed by the Prosumer is accounted at the applicable retail tariff and total solar power generated is accounted for at a tariff determined by the Commission.*
- (f) *“Group Net Metering” means a mechanism whereby surplus energy generated/ injected from a Renewable Energy System or Battery Energy Storage System (BESS) charged through Renewable Energy System is exported to the grid through Net Meter and the exported energy is adjusted in more than one electricity service connection(s) of the same consumer located within the same distribution licensee’s area of supply;*
- (g) *“Virtual Net Metering” means a mechanism whereby entire energy generated/ injected from a Renewable Energy System or Battery Energy Storage System (BESS) charged through Renewable Energy System is exported to the grid from renewable energy meter/ gross meter and the energy exported is adjusted in more than one electricity service connection(s) of participating consumers located within the same distribution licensee’s area of supply;*

Existing Clause 2 (e) of the “Definitions” shall be replaced as under:

- (i) *“Prosumer” means a Consumer of electricity in the area of supply of the Distribution Licensee, who uses a self-owned or third party-owned Solar Power System installed at the Consumer’s premises, to offset part or all of the Consumer’s electricity requirements and can also inject electricity into the Grid using same point of supply.*

The existing Clause 2 (d) and Clause 2 (f) shall be read as Clause 2 (h) and Clause 2 (j) respectively.

The following shall be inserted after existing Clause 14.

15. Applicability of virtual net metering and group net metering framework

- (a) *Virtual Net Metering Framework shall be applicable for consumers under “Domestic” and “Specified Public Purpose” category as per OERC Distribution (Conditions of Supply) Code, 2019 as amended from time to time, and also for the offices of Government/ local authorities.*
- (b) *The capacity of the Renewable Energy System under Group Net Metering or Virtual Net Metering framework to be installed by any Renewable Energy Generator shall not be less than 5 kW and more than 500 kW.*

The existing Clause 15 and Clause 16 shall be read as Clause 16 and Clause 17 respectively.

The above amendment shall come into force prospectively from the date of its Notification.

This amendment Order is issued with the approval of the Commission.

**Sd/-
SECRETARY**